

The Examiner is thanked for allowing claims 1-37, 43, 50 and 59.

Claim Rejections Under 35 USC § 103

Claims 38-42, 44-49, 51-57 and 60 were rejected under 35 USC § 103(a) as being obvious over US Patent 180,881 to Howson in view of US Patent 5,441,225 to Hall.

5 The invention recited in claim 38 is patentable over Howson and Hall, both individually and in combination. Howson teaches a pair of “elastic or yielding” arms *h, h* each forming part of a socket portion of a ball-and-socket support. An iron ball *D* is captured in the socket, and the two arms *h, h* are tightened together to firmly grip the ball *D*. Col. 1, paragraphs 4-6. The ball *D* is formed of iron. Col. 4, lines 4-8. Howson therefore teaches using the resilience of
10 the arms *h, h* to grip the incompressible iron ball *D*.

Hall teaches an element 22 formed of three orthogonal elements 23, 24, 25 each having a circular profile that are joined together to form an “overall spherical profile.” Col. 4, lines 21-25. The orthogonal elements are formed of polyurethane. Col. 3, lines 37-41.

15 The present invention recited in claim 47 is a coupling member having a radially compressible material formed in a substantially spherical shape and a socket having substantially smooth concave surfaces coextending with a portion of the uncompressed outer diameter of the spherical portion of the coupling member. The socket is clamped in one position with the coupling member being relatively rotatable thereto, and in a second position with the socket compressing the radially compressible material of the coupling member,
20 whereby the socket members substantially compress the coupling member therebetween and extrude a portion of the coupling member external to the socket members.

25 The invention of claim 47 for compressing the coupling member in the socket and extruding a portion around the socket is fully supported by the text and figures of the application as originally filed. See, Figure 5 and see generally col. 14, line 8 - col. 15, line 27, and in particular see col. 15, lines 2-17. See, also, generally col. 11, line 60- col. 12, line 29 and in particular see col. 12, lines 1-25. See, also, generally col. 13, line 4 - col. 14, line 7, and more particularly see col. 13, lines 38-54.

The present invention recited in claim 47 is patentable over both Howson and Hall, individually and in combination.

First, the Howson and Hall references cannot be combined to teach “a coupling member having a radially compressible material formed in a substantially spherical shape” as recited in claim 47 of the present invention. Neither Howson nor Hall provides any motivation or suggestion that the two references can be combined to provide this element. Rather, both Howson and Hall teach directly away from the combination.

Howson specifically teaches a ball *D* having a solid spherical surface and being formed of an incompressible metallic substance, iron. Figure 1; and col. 4, lines 4-8. The solid surface of the ball *D* is necessary so that the two resilient arms *h*, *h* can “firmly grip the ball.” Howson needs the solid surface to maximize friction between the ball and socket. Howson thus specifically teaches away from both the compressibility and the open surface of the element 22 of Hall that limits the ball’s surface engagement with the socket.

In stark contrast to Howson, Hall specifically teaches an element 22 that must be formed of three orthogonal elements 23, 24, 25 formed of an elastic material. The three orthogonal elements 23, 24, 25 ensure a “noncontinuous surface” that “allows a limited degree of frictional movement.” Col. 4, lines 47-53.

Hall specifically substituted the orthogonal elements 23, 24, 25 for a solid ball for several reasons. First, the orthogonal configuration “allows the ball to be fabricated with closer tolerance on its external periphery” than would be possible with a solid ball. Col. 3, lines 37-44. Next, a solid ball would be “extremely difficult to fabricate with a smooth, external profile due to the inherent nature of a plastic part of any appreciable thickness to shrinkage and ‘dimpling’ upon cooling.” Col. 3, lines 44-55. Thirdly, the orthogonal configuration allows easier adjustment with the socket because of the reduced contact area results in reducing the frictional forces over those encountered if the ball were solid. Col. 3, lines 56-63. Therefore, even when held in “snug, frictional engagement,” the ball can be turned relative to the socket. Col. 3, line 64-col. 4, line 4; and col. 4, lines 36-39. In contrast, a ball with a solid surface would be in either a free turning relationship with the socket or fixed, while the orthogonal configuration permits a limited degree of relative movement. Col. 4, lines 47-53. This last is an important feature of the ball-like element of the Hall invention. Col. 4, lines 40-53.

Hall thus specifically teaches away from the solid spherical surface of the ball *D* as taught by Howson that maximizes the surface engagement with the socket to “firmly grip the ball.” Howson at col. 1, last paragraph. See, *e.g.*, Hall at col. 3, lines 56-63, where Hall specifically argues the benefits of the orthogonal elements over a ball having a solid surface.

5 Hall also teaches away from the incompressible material, *e.g.*, iron, of Howson’s ball *D*, by teaching instead a configuration of orthogonal elements that are formed of a deformable substance, *e.g.*, polyurethane. Col. 3, lines 44-50.

 Since Howson and Hall both teach away from the art of the other, neither suggests combining the two references. Furthermore, the teaching of Howson away from Hall and the
10 teaching of Hall away from Howson makes Howson and Hall an improper combination of references under 35 USC § 103(a).

 Furthermore, even if the Howson and Hall reference were a proper combination, which they are not, the invention recited in claim 47 is patentable over both Howson and Hall, either alone or in combination.

15 The Examiner admits and the Applicant agrees that Howson does not teach the radially compressible coupling member of claim 47. Rather, Howson teaches a ball *D* having a solid spherical surface and being formed of iron, which cannot be combined with the element 22 of Hall that must be three orthogonal elements 23, 24, 25 formed of an elastic material.

 Furthermore, Howson and Hall, either alone or in combination, fail to disclose or
20 suggest the adjustment of the clamp positioning the socket members in an opposing relationship on either side of the coupling member and compressing the radially compressible material thereof, whereby the socket members substantially compress the coupling member therebetween and extrude a portion of the coupling member external to the socket members to interlock the socket members with the coupling member in a relative angular orientation, as
25 recited in claim 47.

 Howson teaches an incompressible iron ball that obviously cannot be extruded externally to the socket members, as recited in claim 47.

 Hall fails to provide the deficiencies of Howson. Hall fails to disclose or suggest an adjustment of the clamp whereby the socket members substantially compress the coupling

member therebetween and extrude a portion of the coupling member external to the socket members, as recited in claim 47. Rather, in contrast to the present invention, the three orthogonal elastic elements 23, 24, 25 of the element 22 as taught by Hall must inherently buckle or collapse under the clamp's compressive force rather than be extruded externally to the socket.

Furthermore, in contrast to the invention recited in claim 47, the three orthogonal elastic elements 23, 24, 25 of the element 22 as taught by Hall leave generous trihedral spaces between the orthogonal elements 23, 24, 25 for the material to collapse into internally to the socket halves 32, 34. See, Figure 2. Therefore, by teaching the orthogonal structure of the element 22, Hall implicitly teaches away from the structure of claim 47 that extrudes a portion of the coupling member external to the socket members to interlock the socket members with the coupling member.

For each of the above reasons, claim 47 is allowable over the Howson and Hall references, both individually and in combination.

Claims 38-39, 52, 58 and 60 differ in scope from allowable claim 47. However, the above arguments directed to claim 47 are sufficiently applicable to claims 38-39, 52, 58 and 60 as to make repetition unnecessary. Thus, for each of the reasons above, claims 38-39, 52, 58 and 60 are believed to be allowable over the cited art.

Claim 39 is also allowable as reciting a coupling member partially formed of a resilient deformable material substantially encompassing a mechanical core adapted to accept a mechanical attachment outside the unconstrained diameter.

The Examiner admits and the Applicant agrees that Howson does not teach the resilient deformable coupling member of claim 39. Rather, Howson teaches a ball *D* formed entirely in cast iron for "economy of construction." Col. 4, lines 4-8.

Hall fails to provide the deficiencies of Howson. Hall fails to disclose or suggest forming a coupling member of resilient deformable material around a mechanical core, as recited in claim 39. Rather, Hall teaches an element 22 formed entirely of an elastic material for producibility by injection molding. Col. 4, lines 22-31.

Thus, in contrast to the present invention, Howson and Hall both teach forming the coupling member of a single material and thus teach away from a resilient deformable material substantially encompassing a mechanical core, as recited in claim 39.

For each of these additional reasons, claim 39 is allowable over the Howson and
5 Hall references, both individually and in combination.

Allowable Subject Matter

The Examiner is thanked for notifying the Applicant that claims 58 and 61 contain allowable subject matter and will be allowable when rewritten in independent form, including the limitations of the base claim and any intervening claims.

10 Claims 58 and 61 are rewritten and are now allowable.

The claims now being in form for allowance, reconsideration and allowance is respectfully requested.

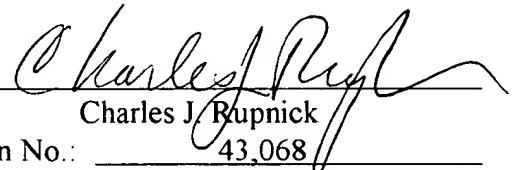
For the Examiner's convenience, an Attachment hereto shows the amended claims having the changes thereto incorporated therein.

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If the Examiner has questions or wishes to discuss any aspect of the case, the Examiner is encouraged to contact the undersigned at the telephone number given below.

Respectfully submitted,

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